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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/665,581	09/18/2000	Erlend Olson	1875.0160000/RES/JTH	4718

7590 03/11/2004
Sterner Kessler Goldstein & Fox PLLC
1100 New York Avenue NW
Suite 600
Washington, DC 20005-3934

EXAMINER

NGUYEN, DUC M

ART UNIT	PAPER NUMBER
2685	11

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/665,581

Applicant(s)

OLSON, ERLAND

Examiner

Duc M. Nguyen

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 and 33-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-30 and 56-63 is/are allowed.
- 6) ☒ Claim(s) 1-11, 22-25, 31, 33-47 and 53-55 is/are rejected.
- 7) ☒ Claim(s) 12-21 and 48-52 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9, 10</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to applicant's response filed on 12/12/03. Claims 1, 31, 33-63 are now pending in the present application.

Information Disclosure Statement

The references listed in the information disclosure statements submitted on 12/2/04 and 2/4/04 have been considered by the examiner (see attached PTO-1449).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

1. Claims **53-55** are rejected under 35 U.S.C. 102(a) as being anticipated by **Moore et al** (US 6,035,186).

Regarding claims **53-55**, Moore discloses a method for a receiver comprising

- a preselected filter 12 for filtering as claimed (see Fig. 3 and col. 3, lines 11-12);
- an mixer for dividing and mixing RF signal with LO signal as claimed (see Fig. 3 and col. 4, lines 5-55).

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- an IF filter for combining I and Q outputs of the mixer as claimed (see Fig. 4 and col. 4, lines 52-55). Here, the poly-phase filter would read on the IF filter as claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims **1, 3-6, 22, 25, 45** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Moore** in view of **Imbonone** (US 6,529,719).

Regarding claims **1, 25**, the claim is rejected for the same reason as set forth in claim **53** above. In addition, since the phase receiver in Figs. 3, 4 is used to suppress image frequency, it is clear that the mixers in Moore are image reject mixer as clearly disclosed by Imbonone (see Fig. 3 and col. 3, lines 30-32). Further, since only channel with $f_{\text{selected}} = f_{\text{IF}} \pm f_{\text{LO}}$ would pass through the IF filter, it is clear that the down converting selected channel has the frequency determined by the frequency of the oscillator as claimed (see col. 4, lines 13-20, noting that $f_{\text{selected}} = f_{\text{IF}} \pm f_{\text{LO}}$). Further, since Moore and Imbonone disclose a receiver, and since the tuner is a receiver, it would have been obvious to one skill in the art to apply teachings of Moore and Imbonone to a tuner and it would work equally well. Therefore, the claimed limitations

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are made obvious by Moore and Imbonone for providing a tuner as claimed, so that the tuner can be fabricated as an integrated tuner.

Regarding claim 3, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since fabricating the tuner on a single silicon substrate is known in the art, it would have been obvious to one skill in the art to modify teachings of Moore and Imbonone to fabricate the tuner on a single silicon substrate as claimed, for providing a light weight, low cost tuner.

Regarding claim 4, the claim is rejected for the same reason as set forth in claim 1 above. In addition, it is clear that Moore would disclose an undesired image of the selected channel is suppressed by the image reject mixer (see col. 4, lines 5-7, col. 5, lines 23-27).

Regarding claim 5, the claim is rejected for the same reason as set forth in claim 1 above. In addition, Moore discloses two or more components as claimed (see Fig. 3).

Regarding claim 6, the claim is rejected for the same reason as set forth in claim 1 above. In addition, Moore discloses a polyphase filter as claimed (see Fig. 4).

Regarding claim 22, the claim is rejected for the same reason as set forth in claim 1 above. In addition, Moore discloses the pre-selected is the bandpass filter (see Fig. 3 and col. 3, lines 11-12).

Regarding claim 45 the claim is interpreted and rejected for the same reason as set forth in claim 1 above.

3. Claims **2, 8-11, 23-24, 46-47** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Moore** in view of **Imbonone** and further in view of **Widmer et al** (US 6,169,569).

Regarding claim **2**, the claim is rejected for the same reason as set forth in claim **1** above. In addition, since using the frequency of LO signal for tuning is well known in the art as disclosed by Widmer (see Fig. 2 and col. 6, lines 12-34), it would have been obvious to one skill in the art to incorporate teaching of Widmer into Moore and Imbonone for using PLL to adjust the LO frequency to change the selected channel, in order to tune the receiver over a wide frequency range.

Regarding claim **8**, the claim is rejected for the same reason as set forth in claim **2** above. In addition, since Widmer further discloses the pre-selected filter for the tuner is calibrated by the PLL (see Fig. 2 on adjustable bandpass filters 60-1, 64-1), it would have been obvious to one skill in the art to further incorporate teaching of Widmer into Moore and Imbonone for calibrating the pre-selected filter as claimed, for eliminating interference or noise from un-selected channels.

Regarding claim **9**, the claim is rejected for the same reason as set forth in claim **2** above. In addition, since Widmer discloses that the LO signal is tuned or controlled by the PLL (see Fig. 2 and col. 6, lines 35-40), and since the LO signal is fed to the mixer, this would read on the limitation of "calibrating the mixer". Therefore, it would have been obvious to one skill in the art to further incorporate teaching of Widmer into Moore and Imbonone for calibrating the mixer by using PLL to adjust the LO

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frequency based on the locking frequency of the selected channel, in order to tune the receiver to the selected channel.

Regarding claims **10-11**, the claims are rejected for the same reason as set forth in claim **2** above. In addition, since Widmer discloses an AGC amplifier coupled between the pre-select filter and a mixer (see Fig. 2), and that the select channel is amplified with sufficient gain to eliminate any contribution of noise from successive stages of the tuner (see col. 6, lines 20-34), it is clear that the gain of the AGC is calibrated for the selected channel. Therefore, it would have been obvious to one skill in the art to further incorporate teaching of Widmer into Moore and Imbonone for calibrating the amplifier as claimed, for improving signal reception quality.

Regarding claims **23-24**, the claims are rejected for the same reason as set forth in claim **2** above. In addition, since Widmer discloses that the PLL is used lock the frequency of the selected channel, and is also used to adjust bandpass of the pre-select filter (see Fig. 2 and col. 6, line 17-26), it would have been obvious that such adjustment is used to compensate to frequency drift of the selected channel based on the locking frequency of the PLL.

Regarding claim **46**, the claim is interpreted and rejected for the same reason as set forth in claim **2** above.

Regarding claim **47**, the claim is interpreted and rejected for the same reason as set forth in claim **2** above, wherein it is clear that when re-calibrating the tuner, the steps of filtering or frequency conversion are repeated again which would read on the limitation as claimed.

4. Claims **31, 33, 37** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Suominen** (US 6,427,069) in view of **Wynn** (US Pat No. **6,009,317**).

Regarding claim **31**, **Suominen** discloses a method for correcting (imbalance) I/Q components of a tuner (see Abstract, Figs. 1, 8, and col. 2, lines 20-42, col. 4, line 20 – col. 12, line 67), which would include all the claimed limitations except for a test signal. However, as suggest by **Suominen**, the error correction of I-Q channel should be implemented for each device upon completion of device fabrication. In doing so, it would have been obvious to use a test signal as disclosed by **Wynn** (see Abstract and Fig. 1). Therefore, it would have been obvious to one skill in the art to incorporate teaching of **Wynn** to **Suominen** for using a test signal as claimed, so that I-Q (imbalance) correction can be utilized based on the test signal for improving signal reception quality of the tuner, noting that the correction of coefficients such as Hilbert transform's coefficients would read on "individual hardware parameter" as claimed.

Regarding claim **33**, the claim is interpreted and rejected for the same reason as set forth in claim **2** above, wherein it is clear that when re-calibrating the tuner, the steps of calibrating each component would involve a time delay as claimed.

Regarding claim **37**, the claim is interpreted and rejected for the same reason as set forth in claim **2** above,

5. Claims **34-37** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Suominen** in view of **Wynn** and further in view of **Tzuang et al** (US 5,930,696).

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Regarding claims **34-35**, **Suominen** as modified would disclose all the claimed limitations, see claim 31 above, except a pre-select filter. However, Tzuang discloses a receiver which comprises a pre-select filter (see Fig. 4B and col. 7, line 59 – col. 8, line 5). Therefore, it would have been obvious to one skill in the art to incorporate teaching of Tzuang to Wynn and Suominen for incorporating a pre-select filter to the tuner in order to remove all the interference to the desired channel as much as possible, for improving the overall reception performance of the tuner. Here, since Suominen employs a quadrature I-Q mixer which produces I-Q signals having a relative phase shift of 90 degree, hence when incorporating a pre-select filter to Suominen' tuner, it would have been obvious that when calibrating the pre-select filter using the test signal, the differential output signals of the pre-select filter would be calibrated such that the differential signals would also have a relative phase shift of 90 degree before feeding the mixer in order to maximize rejection of unwanted mixing images at and near the frequency of desired signal (see Suominen, col. 13, lines 1-5). Therefore, it would have been obvious to one skill in the art to combine and modify the teachings of Tzuang, Wynn and Suominen for calibrating I-Q imbalance of the filter as claimed, for maximizing rejection of unwanted mixing images at and near the frequency of desired signal.

Regarding claims **36-37**, the claims are rejected for the same reason as set forth in claim **34** above. In addition, since Tzuang further discloses an amplifier coupled to the pre-select filter (see Fig. 4B), it would have been obvious to one skill in the art to further incorporate teaching of Tzuang to Wynn and Suominen for incorporating an

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amplifier to the tuner for amplifying the selected channel with sufficient gain to eliminate any contribution of noise from successive stages of the tuner, and further modifying the teachings of Tzuang, Wynn and Suominen for calibrating I-Q imbalance of the amplifier as claimed, for maximizing rejection of unwanted mixing images at and near the frequency of desired signal.

6. Claims **38-39, 43-44** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Suominen** in view of **Wynn** and further in view of **McGeehan** et al (US 5,950,119).

Regarding claims **38-39, 43-44, Suominen** as modified would disclose all the claimed limitations, see claim 31 above, except correcting I-Q imbalance of the mixer by calibrating the LO signal. However, McGeehan discloses a receiver, wherein correcting I-Q imbalance of the mixer is done by calibrating the LO signal (see Figs. 5-6 and col. 8, lines 15-41). Therefore, it would have been obvious to one skill in the art to incorporate teaching of McGeehan to Wynn and Suominen for correcting I-Q imbalance of the mixer by calibrating the LO signal, for maximizing rejection of unwanted mixing images at and near the frequency of desired signal.

Allowable Subject Matter

7. Claims **26-30, 56-63** are allowed.

8. Claims **12-21, 48-52** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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As to claims 12, 26, the cited prior art of record fail to disclose or make it obvious an apparatus or method calibrating a tuner for the reason as stated in Applicant's response filed on 12/12/03, pages 15-16.

As to claim 48, the cited prior art of record fail to disclose or make it obvious an apparatus or method calibrating a tuner that comprises steps and components as specified in the claim.

Response to Arguments

Applicant's arguments with respect to claims 1-31, 33-63 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for formal communications intended for entry)

(for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington VA, Sixth Floor (Receptionist).

Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (703) 306-4531,

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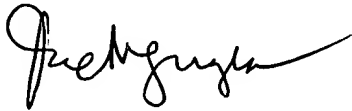
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Monday-Thursday (9:00 AM - 5:00 PM). Or to Edward Urban (Supervisor) whose telephone number is (703) 305-4385.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4700.

Duc M. Nguyen

Mar 5, 2004

A handwritten signature in black ink, appearing to read 'Duc M. Nguyen', written in a cursive style.